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GUIDELINES FOR USE UNDER 780 CMR
SECTIONS R104.11 (RESIDENTIAL CODE) & 104.11 (COMMERCIAL \BASE CODE)
ALTERNATIVE MATERIALS, DESIGN AND METHODS OF CONSTRUCTION & EQUIPMENT

This document is issued to assist building code enforcement officials and other interested parties in determining whether or not Pin Foundations, Inc., DP-50 and DP-75 Diamond Pier Foundations, or similar systems, demonstrate compliance with the Massachusetts State Building Code, both Residential and Commercial \Base Volumes for use in the commonwealth.

The information is presented in question and answer format for ease of understanding. This document is neither a blanket approval nor an endorsement of the referenced foundation systems. Rather, it is intended to present methodologies by which pin foundation systems, similar systems, or *any alternative material or method*, may be reviewed and approved by a building code enforcement official for code compliance.

Question: Are Pin Foundations, Inc., DP-50 and DP-75 Diamond Pier Foundation Systems considered acceptable for use in accordance with 780 CMR (the Massachusetts State Building Code)?

Answer: Yes. In explanation, **780 CMR Section R104.11 Alternative Materials, Design and Methods of Construction and Equipment** states: *"The provisions of 780 CMR are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by 780 CMR, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of 780 CMR, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in 780 CMR in quality, strength, effectiveness, fire resistance, durability and safety".* **Section R104.11.1 Research Reports** indicates that *"Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in 780 CMR, shall consist of valid research reports from approved sources"*.

The International Code Council (ICC) has published Evaluation Services Report (ESR) 1895 specific to Pin Foundations, Inc., DP-50 and DP-75 Diamond Pier Foundation Systems for use as foundations to support gravity loads *for exterior decks, including covered decks, elevated walkways, stairway construction and accessory structures* in any weathering classifications as defined in IRC Figure R301.2(3). In general, the report indicates that the pin piers, which consist of a factory-fabricated, precast, diamond-shaped concrete head with a galvanized steel anchor bolt cast into the center and jobsite-installed galvanized steel bearing pins, are suitable for most conditions *"... when installed in accordance with this report in minimum allowable 1500 psf soils per IRC Table R401.4.1"*.

780 CMR Table R301.2 (1) establishes a frost line depth of 48 inches and a *severe weathering potential* for Massachusetts. When installed in accordance with ESR-1895, the pin footings provide adequate bearing area for



supporting gravity loads in compliance with the code. However, ESR-1895 is not a blanket approval of the product. Like any material used in the construction of a building, pin piers must be clearly detailed on plans and specifications submitted for permit as required by 780 CMR Section R107, identifying the type of system used, pin length and soils conditions. Ultimately, it is the responsibility of the building code enforcement official to determine that the product, as detailed, is satisfactory and complies with the intent of the code.

In determining code compliance, the following conditions shall be considered.

1. Model DP-50 and DP-75 Diamond Pier foundations shall not be installed in Massachusetts with steel bearing pins of a length less than 50 inches.
2. Installation of Model DP-50 and DP-75 Diamond Pier foundations in Massachusetts shall conform to the supplied Pin Foundation's Inc. published installation manual, the most recent version of the Residential Diamond Pier Load Chart, and ICC Evaluation Service Report (ESR) 1895.
3. Installation and use of the Model DP-50 and DP-75 Diamond Pier foundations in Massachusetts shall not be permitted in soil conditions that are not suited to support the system. (Please refer to the most recent version of the Residential Diamond Pier Load Chart.)
4. Installation and use of the Model DP-50 and DP-75 Diamond Pier foundations in Massachusetts shall not be permitted for structures with asymmetrical, rotational, overturning, or dynamic forces. (Please refer to section 2.0 of ICC-ES Report ESR-1895.)

If all conditions are meant as herein specified, the building code enforcement official shall approve the use of Pin Foundations, Inc., DP-50 and DP-75 Diamond Pier Foundation Systems under 780 CMR Section R104.11 with supporting documentation as required by 780 CMR Section R104.11.1 and identified below. Since pin foundation systems are pre-engineered, no further professional design services (RDP) are required for the submission of plans and/or specifications for use under the residential code.

At minimum, supporting documentation shall include (*supporting documentation should be stored with the building permit file*):

- ICC Acceptance Criteria for Bearing Pin Piers (AC336)
- ICC-ES Report ESR-1895 (Diamond Pier DP-50 & DP-75 for Bearing Pin Piers)

For additional information as it relates to this product, please see refer to the following documentation available on-line.

- *Diamond Pier Foundation System: Code Compliance Information for Diamond Pier Foundations in the State of Michigan*
- *Diamond Pier Foundation System: Code Compliance Information for Diamond Pier Foundations in the State of Minnesota*
- *Residential Diamond Pier Load Chart* (<http://pinfoundations.com/>)
- *Wisconsin Department of Safety and Professional Services: Industry Services Division – Wisconsin Building Product Evaluation (Product #201612-O)*

Question: What about other types and models of pin foundation systems for larger residential and/or other buildings designed under the Commercial\ Base Code; are they acceptable for use in Massachusetts as well?

Answer: In general, the answer to this question is also yes. However, in most instances, registered design professional (RDP) services will be required to demonstrate code compliance for these types of projects. Sections 104.11 and 104.11.1 of the Commercial\Base Code provide identical language for review and approval of alternative methods and materials for use under the code. Therefore, the exact same logic and methodology would be used to demonstrate code compliance for these larger projects, but Section 107 establishes that larger, more complex projects are subject to construction control requirements and the general laws of the commonwealth typically require RDP services.